

DESCRIPTION OF THE PUPA OF *CULISETA MELANURA*(DIPTERA: CULICIDAE)<sup>1</sup>RICHARD F. DARSIE, JR., EDWARD E. TINDALL and A. RALPH BARR<sup>2</sup>

It is now well established that *Culiseta melanura* (Coquillett) is involved in the transmission of eastern encephalitis in the eastern United States (Chamberlain *et al.*, 1951; Holden *et al.*, 1954; Burbulis and Jobbins, 1957; Feemster, 1958). Such an important species should be recognizable in all of its stages. The present report is a detailed description of the pupa, previously undescribed.

In this description the setal nomenclature of Barr and Myers (1961) is used. The range, mode and mean number of branches for each hair are listed in Table 1.

***Culiseta (Climacura) melanura* (Coquillett)**

*Cephalothorax* (Fig. 1).—Ocular setae 1, 2 and 3 usually double or triple, long, and pedunculate; seta 2 subequal to 3 in length; prothoracic setae 4, 6, and 7 long, sometimes pedunculate, generally 2- to 5-branched; seta 6 about as long as 7; 5 3- to 7-branched; mesothoracic setae 8 and 9 long, pedunculate, generally 4- to 5-branched; metathoracic setae (Fig. 3) 10 and 11 long, with an average of 8 and 5 branches respectively; 12 pedunculate, long, 2- to 4-branched.

*Respiratory Trumpet* (Fig. 2).—Base narrow, widening toward apex; surface distinctly reticulate, with a small tracheoid patch near base; 0.35 to 0.51 mm. long; averaging 2.14 times as long as pinna and 2.85 times as long as its greatest diameter.

*Abdomen* (Fig. 3).—Reticulation on segment 1 between float hairs usually present and distinct, but with thin lines; *Hair 0* absent on I; single, usually minute, anterior on II-VIII. *Hair 1* a well developed float hair on I; long, usually 10- or 11-branched on II; long, 4- to 10-branched on III-IV; 2- to 6-branched on V to VII; absent on VIII. *Hair 2* single, medium to long on I and II; minute to small on III-VII; absent on VIII. *Hair 3* short on I-III, longer on IV-VII; with 3-5 branches on I; 1-5 branches on II; usually double on III-IV; 2-4 branches on V-VII. *Hair 4* long, sometimes pedunculate; usually 4- to 6-branched on I-IV; double or triple on V-VIII. *Hair 5* short on I, medium to long, sometimes pedunculate on II-VII, somewhat stout on IV-VII; usually 4- to 6-branched on I to III; long, usually 4- to 8-branched on IV to VII. *Hair 6* single, very long on I; long on II-VI, medium on VII; 1- to 4-branched on III-IV; 1- to 3-branched on V-VI; usually 4- to 6-branched on VII; absent on VIII. *Hair 7* dorsal on I, lateral on II, long, 1- to 5-branched on I and II; ventral, small to medium, pedunculate, generally 2- to 4-branched on III-V; long, single on VI

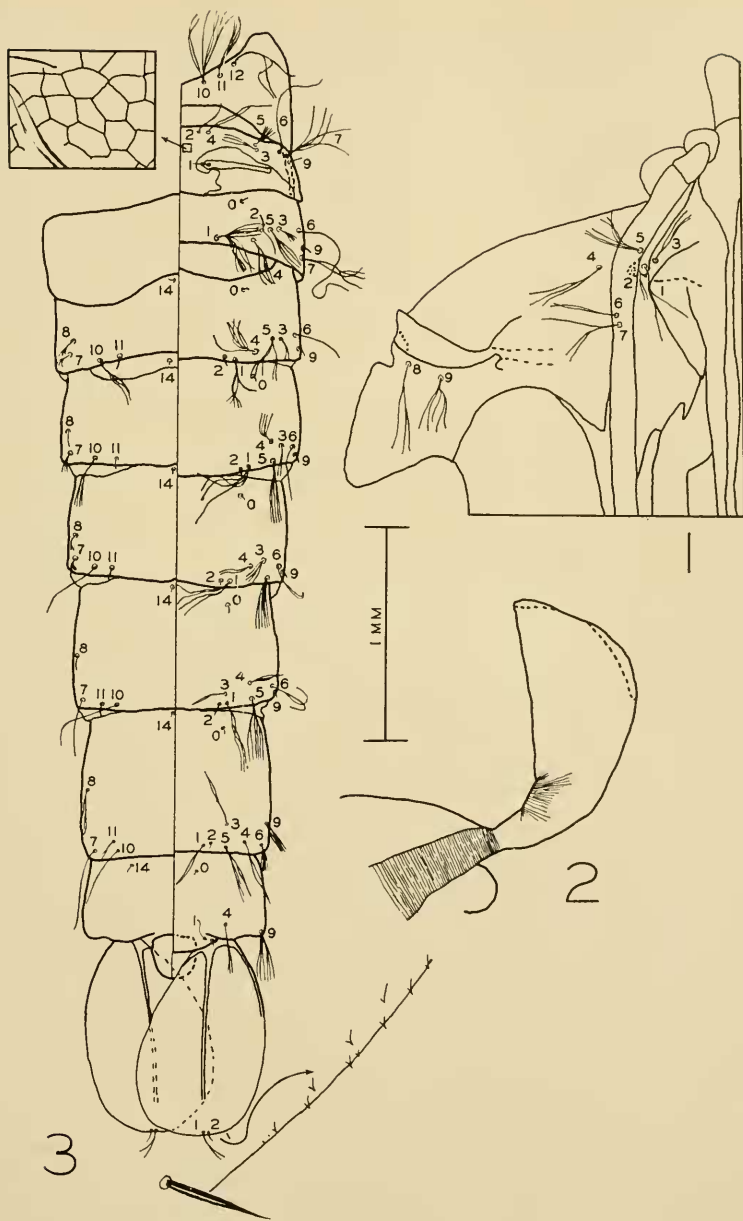
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Table 1. Record of the branching of the setae on the pupae of *Culiseta melanura*.

Seta	Range	Mode*	Average	Seta	Range	Mode*	Average
Cephalothorax				Abdomen IV (Cont'd)			
1	1-4	2	2.1	5	4-9	6:8	6.8
2	1-4	2	2.3	6	2-4	2:3	2.6
3	1-4	3	2.9	7	1-5	2:1	2.1
4	2-5	3	3.4	8	1-3	1	1.3
5	3-7	5	4.9	9	1	1	1
6	2-5	3:2	2.8	10	1-4	2	2.2
7	2-5	3:4	3.5	11	1	1	1
8	2-6	4	3.9	Abdomen V			
9	3-7	5:4	4.7	1	2-6	4:5	4.9
Methathorax				2	1	1	1
10	5-10	8:7	8.2	3	3-5	3:4	3.6
11	3-8	5:4	5.2	4	1-4	2	2.2
12	2-4	3	3.3	5	3-8	6:8	6.4
Abdomen I				6	1-3	3	2.4
2	1	1	1	7	1-5	3:4	3.3
3	3-5	4	3.9	8	1-2	1	1.2
4	2-7	5:4	4.3	9	1	1	1
5	3-6	4:5	4.4	10	1-2	1	1.1
6	1	1	1	11	1	1	1
7	1-5	4	3.9	Abdomen VI			
9	1-2	1	1.2	1	2-5	4:3:5	3.9
Abdomen II				2	1	1	1
1	6-14	11:10	11.2	3	1-3	2	2.1
2	1	1	1	4	2-4	3:2	2.8
3	1-5	1	1.6	5	4-9	5:7:8	6.6
4	3-10	6	5.4	6	1-3	3	2.6
5	3-8	5:4	4.9	7	1	1	1
6	1	1	1	8	1-2	1:2	1.5
7	1-5	1:4	2.7	9	1	1	1
9	1	1	1	10	1	1	1
Abdomen III				11	1	1	1
1	5-10	7	7.4	Abdomen VII			
2	1	1	1	1	2-4	3	2.9
3	1-5	2	1.9	2	1	1	1
4	4-9	5:6	5.8	3	1-4	2	2
5	4-9	5:6	6.2	4	1-4	2	2
6	1-4	3	2.6	5	3-6	5:4	4.8
7	1-4	2	2.5	6	2-7	4:5:6	5.1
8	2-5	3	3.1	7	1	1	1
9	1	1	1	8	2-4	2:3	2.9
10	1-4	2:3	2.1	9	4-7	5	5.5
11	1	1	1	10	1	1	1
Abdomen IV				11	1-2	1	1.3
1	3-9	5:6	5.9	Abdomen VIII			
2	1	1	1	4	1-3	2	2.4
3	1-3	2	1.7	9	6-10	?	8.5
4	3-4	4	3.7	Paddle			
Abdomen V				1	1-3	1:2	1.7
Abdomen VI				2	1	1	1

\*Mode—Represents 50 percent or more of the hairs counted.



Pupa of *Culiseta melanura* (Coquillett). Fig. 1, portion of cephalothorax; fig. 2, respiratory trumpet; fig. 3, metathorax and abdomen (dorsal—right; ventral—left. Drawn from a ♀ collected in Orlando, Florida, Feb. 10, 1955, by H. C. Chapman.

and VII. *Hair 8* absent on II; medium, usually 3-branched on III and VII; generally single on IV-VI. *Hair 9* minute to small; sometimes double on I: single on II-VI; long, 4- to 7-branched on VII; long, 6- to 10-branched on VIII. *Hair 10* absent on II; long, pedunculate, 2- to 3-branched on III-IV; long and single, seldom 2-branched on V-VII. *Hair 11* absent on II; small and single on III-VI; small to medium, sometimes pedunculate, 1- to 2-branched on VII. *Hair 14* absent on II; single, minute, medio-anterior on III-VII; single and small, displaced laterally on VIII. Segment IX with small hair (1) near posterior corner.

*Hypopygium*.—With prominent, dark spicules ventrally in both sexes.

*Paddle* (Fig. 3).—Ovoid, submarginal denticles present on apical one fourth of border; surface smooth, midrib not reaching apex; terminal seta 1 medium, often pedunculate, single or double; accessory seta 2 small and single; index 1.39-1.74, averaging 1.58.

The description is based on the following specimens: NEW HAMPSHIRE, 7 ♀♀ and 1 ♂ from Center Harbor (in poor condition); CONNECTICUT, 1 ♀ and 2 ♂♂ presumably from that state (R. D. Wallis); NEW JERSEY, 2 ♂♂ from Lahaway (Brakeley), 2 ♀♀ from Mays Landing (H. C. Chapman), FLORIDA, 9 ♀♀ and 2 ♂♂ from Orlando (H. C. Chapman).

The pupa of *C. melanura* can be distinguished from all other known Nearctic *Culiseta* pupae by the presence of a second apical seta on the paddle. A key to all the known Nearctic *Culiseta* pupae will be published in the near future by one of us (Barr, 1962) and the reader is referred to this work for identification of the group. It also contains a discussion of the generic concept of *Culiseta* pupae.

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